

## **Enabling In-Situ Magnetic Interference Mitigation Algorithm Validation via a Laboratory-Generated Dataset**

This work establishes a database comprising reaction wheel interference and pseudo-geophysical signals to evaluate the efficacy of interference removal algorithms. It represents the first comprehensive open-source repository of interference sources, setting a benchmark for the development of future magnetometer payloads in both space and terrestrial environments. By providing a diverse array of interference patterns and geophysical analogs, this resource facilitates the development and validation of more robust and versatile algorithms. Furthermore, it encourages collaborative efforts within the scientific community to enhance the accuracy and reliability of magnetometric measurements across various missions and studies.

### **General Comments**

The accessibility of this work would greatly benefit with the inclusion of an example/tutorial script to show loading the data and creating custom signal permutations.

### **Line Comments**

**L41-50:** Recommend including a discussion on the constraints of CubeSat in terms of volume and cost to highlight the necessity for shorter spacecraft booms. (Miles, D. M., Mann, I. R., Ciurzynski, M., Barona, D., Narod, B. B., Bennest, J. R., ... & Milling, D. K. (2016). A miniature, low-power scientific fluxgate magnetometer: A stepping-stone to cube-satellite constellation missions. *Journal of Geophysical Research: Space Physics*, 121(12), 11-839.)

**Figure 4:** Please describe in the caption the black item located between the magnetometers and the reaction wheel apparatus. Is this another magnetometer?

**L161:** Suggest using the same wording as L91 when discussing amplitude discontinuities below 1 Hz to improve readability.

**L165:** The comment regarding “hard working postdocs” should be omitted to maintain a professional tone.

**Figure 5:** The caption requires additional details regarding the rows depicted.

**L199-200:** The phrasing “Their associated interference” is unclear. Also, is the whistler mode wave the interference or the pseudo-geomagnetic signal in this case?

**L200:** Add citation for whistler waves: Teng, S., Tao, X., & Li, W. (2019). Typical characteristics of whistler mode waves categorized by their spectral properties using Van Allen Probes observations. *Geophysical Research Letters*, 46(7), 3607-3614.

**L245:** Recommend changing “easily serve” to “... well-suited...”